

or the previous symptoms in this case. But in most such cases reason for suspicion of glaucoma might have been found before the use of the mydriatic. There have now been placed on record quite a number of cases in which homatropine was the drug that provoked the outbreak of glaucoma. It should be universally understood that, in this connection, it is less dangerous than the other mydriatics only in so far as the dilatation of the pupil it causes may be overcome more quickly.—ED.]

**Poisoning by Homatropine and Cocaine.**—S. STEPHENSON (London) reports the case of a girl, aged three, who received nine applications of a solution containing 2 per cent. each of homatropine and cocaine to the eyes in ninety minutes. Three hours later she failed to recognize familiar faces, picked at the coverlet, tried to grasp invisible objects, babbled strangely, and persisted in getting out of bed. Her pupils were widely dilated, her face flushed, her lips and tongue parched. There was no eruption. She recovered entirely within twenty-four hours.—*Ophthalmic Review*, July, 1900.

[The symptoms mentioned are those of homatropine poisoning, which are closely allied, but probably not identical with those of poisoning by atropine.—ED.]

## HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

CHARLES HARRINGTON, M.D.,

ASSISTANT PROFESSOR OF HYGIENE, HARVARD MEDICAL SCHOOL,

AND

EDWARD F. WILLOUGHBY, M.D.,

OF LONDON.

**Plague and Rats.**—The connection of rats with the spread of plague has long been suspected where the disease is endemic, and, in 1897, YEESIN advanced the proposition that before the disease prevails anywhere among human beings the rats of the locality are first affected. In the infected areas of India it is said that much evidence of direct transmission from mice to man has been collected. An exceptionally good case is related by BELL (*The Lancet*, May 26, 1900), though it is not conclusive, since the possibility of outside infection must be admitted. The victim was an adult Chinaman bitten in the thumb by a rat. The wound was treated by domestic methods, but at the expiration of three days the man sickened and died of plague, the diagnosis of which was confirmed by bacteriological examination.

It has been alleged that the rat acts only indirectly as the carrier of infection and that the immediate agent is the flea which infests him. GALLI-VALERIO, however, asserts (*Centralblatt für Bakteriologie, etc.*, January 6, 1900) that though the fleas which infest rats and mice may contain the plague bacillus in their tissues it has not been proved that they may transmit the

disease to man, and that the most common of the several species will not bite man at all. Certain it is at least that they would not bite him, for he confined specimens on various parts of his body under small watch glasses kept in place for twenty-four to forty-eight hours, and received not a single bite, although the kind that infests man bites him very freely. Possibly, however, some peculiarity of the skin secretions may be the explanation of their refusal to bite. Thus LOIR (*Revue Scientifique*, March 31, 1900, p. 395), being struck with the immunity enjoyed by oil carriers in past epidemics, conceived that this was due to the oil with which their persons and clothing are drenched. He made a number of experiments to ascertain if fleas would invade the fur of a rat soaked in oil, and found that they would not. He took a rat which was swarming with fleas, killed it, and placed its body in a cage in which were confined two other rats, one with normal skin and the other well oiled. When the dead body became cold all the fleas left it and went to the rat with the dry skin, not one attaching itself to the other. Loir concluded that the fleas' aversion for oil might be the explanation of the immunity noticed.

While authorities are not unanimous on the question of the importance of rats in the dissemination of plague, the subject is receiving most serious attention, and in many places a war of extermination has been inaugurated. In Hamburg, for example, an order was issued in the autumn to the police and harbor police to pay five pfennigs for each dead rat delivered before February 10 of the present year. At Aden the reward is a cent apiece for all killed within the limits of the town. At Paris the public authorities have been much stirred up for some years by the rat nuisance, and now, in view of the possibility of invasion by the disease, are especially desirous of preventing new importations and killing off those already on the ground. When the diggers for the Exposition began work some of the neighboring streets, according to *Gesundheit*, No. 4, 1900, were so extensively invaded by rats that the residents dared not leave a child in a yard or garden unattended. The markets swarmed with them, and at night the thickest meat chests were gnawed through. Cats were found of no use against them, since they are so accustomed to being fed and cared for that mice afford them merely a simple means of amusement, and rats are avoided. Where large numbers of them have been placed in the markets it has been observed that at night they affiliate with the rats in a friendly way, and make common cause against the provisions. Poison proved more effective, but only for a time, since rats become wary. Traps are useful, but not adapted to extermination on a large scale, and, moreover, rats soon learn wisdom by experience, and avoid them. Some varieties of dogs are most energetic rat hunters, among them the bull terrier, fox terrier and rat terrier. At the police headquarters four of the latter were used with great effect and were active both day and night.

The problem of exterminating rats by means of bacterial agencies has been studied by J. DANYSZ (*Revue d'Hygiene* and *Annales de l'Institut Pasteur*, April, 1900) with some success. He employed a cocco-bacillus which resembles the bacillus of LOEFFLER (*B. typhi murium*), which is pathogenic for mice. Danyisz isolated his organism from an epidemic among field mice, and found from the beginning that it was slightly pathogenic for gray rats, that is, out of ten specimens fed with a culture of it two or three would die, others